

EFFECTIVENESS OF A NEW INSECTICIDE (DIOFENOLAN) FOR CONTROL OF SAN JOSE SCALE, *QUADRASPIDIOTUS PERNICIOSUS* (COMSTOCK) (DIASPIDIDAE), ON PEACH TREES IN NORTHERN GREECE

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ABSTRACT

The effectiveness of the new insecticide diofenolan (Aware) against the San Jose scale, *Quadraspidiotus pemiciosus* (Comstock) (Diaspididae), on peach trees was evaluated. The insecticide was applied in two treatments, in spring and in summer, at a rate of 10 and 15 g a.i./hl (hectoliter), respectively. Methidathion at the rate of 55 g a.i./hl was used as control. Mortality as a result of the application of the new product was about 95%. Application at the above rates reduced parasitization by the endoparasite *Encarsia perniciosi* Tower (Aphelinidae) only slightly, whereas methidathion reduced it by more than 95%.

KEY WORDS: *Quadraspidiotus pemiciosus*, bioecology, control, new insecticide, diofenolan.

INTRODUCTION

The San Jose scale, *Quadraspidiotus pemiciosus* (Comstock) (Hemiptera, Diaspididae), has been reported as a pest of pome and stone fruits in Greece since 1968. Chemical control is effective, provided sprays are applied at the proper time. Although biological control experiments have not yielded the expected rapid results (Kozar, 1990a), the endoparasite *Encarsia perniciosi* (Tower) (Aphelinidae) and some other local entomophages can keep the population density of the pest low. Consequently, application of insecticides that are less harmful to the parasites, especially to *E. perniciosi*, is recommended.

MATERIALS AND METHODS

Chemical control of *Quadraspidiotus pemiciosus* is directed against the swarming larvae (crawlers) which are highly susceptible to insecticides. To determine the optimal timing (appearance of crawlers) for our chemical control trials, we sampled tree shoots, as described by Kozar (1990b), every 15 days in winter and weekly in all other seasons. In addition, spring insect growth stage and percentage of parasitism by *E. perniciosi* were determined by examination of 1000 individuals per sampling date. Insecticide applications to control the insect were made in peach orchards in Macedonia (Northern Greece). The experimental design consisted of complete randomized blocks with four replications. We applied two treatments (sprays) with the new insecticide, diofenolan, in March and June 1993 at the rate of 10 and 15 g a.i./hl, respectively. As control we used methidathion treatment at the rate of 55 g a.i./hl.

RESULTS AND DISCUSSION

In Northern Greece, the San José scale has three generations per year and its endoparasite, *E. perniciosi* four. The rate of mortality of the scale as a result of the application of diofenolan was ca. 95%. This new insecticide inhibits the development of the first- and second-instar nymphs. The construction of the female's dorsal shield is affected; the insect develops an elongated rather than circular shape and remains small. The insects dry out, under the environmental conditions of Northern Greece, in about 36 days when treated with diofenolan in spring and in two months when treated in summer. Diofenolan reduced only slightly the parasitization by *E. perniciosi*, whereas methidathion reduced it by more than 95%. Therefore, the new product fits well into an Integrated Pest Management concept. We did not observe cases of phytotoxicity on peach trees.

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